Commission limited its impairment analysis to carriers seeking to provide xDSL service without voice service. The Commission found that, for such carriers, the alternatives to line sharing — which included self-provisioning loops, obtaining a second loop to serve customers, purchasing the entire first loop and using it to provide voice service in addition to xDSL service, and obtaining the high-frequency portion of the loop from third parties — were either "significantly more costly [than line sharing] or not available ubiquitously, or both."[161]

The D.C. Circuit rejected the Commission's impairment analysis, agreeing with the petitioners that the Commission "completely failed to consider the relevance of competition in broadband services coming from cable (and to a lesser extent satellite)."[162] The court pointed to a number of Commission reports discussing the intensity of facilities-based competition, particularly from cable providers, and concluding that cable operators and CLECs clearly are able to compete and, in fact, hold a market advantage over ILECs in providing advanced services.[163] That state of competition gave the Commission "no reason to think [that requiring line sharing] will bring on a significant enhancement of competition."[164] That being the case, the court found that the Commission was not justified in imposing a line sharing requirement.[165]

Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, 14 FCC Rcd 20192, 20926 ¶ 26 (1999) ("*Line Sharing Order*").

161 *Id.* at 20931 ¶ 36.

162 *USTA*, 290 F.3d at 428.

163 *Id.* at 428-29 (citing *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, 14 FCC Rcd 2398, 2404 ¶ 12 (1999); *Third Report Pursuant to § 706*, 2001 WL 186930, ¶¶ 44, 48 (Feb. 6, 2002)).

164 *USTA*, 290 F.3d at 429.

165 *Id.*

The record in this proceeding confirms the D.C. Circuit's analysis and certainly provides the Commission with no basis to find that imposition of a line sharing obligation *is* necessary and proper. As explained above, there is simply no question that vibrant competition exists in the broadband market *without* resort to line sharing, and that the additional modicum of competition that might result from line sharing accordingly is not necessary to serve any consumer interest or other public interest goal. The dominance of cable operators in the residential and small business broadband market obviously does not depend on line sharing and clearly provides subscribers all of the benefits of a competitive marketplace. CLECs desiring to provide broadband service by using ILEC loops can rely upon the options described above. Reinstating the line sharing obligation to protect just those CLECs that insist on a particular business plan (*i.e.*, providing xDSL service without voice service) accordingly would do little to enhance the already vigorous competition in the broadband market.

Nor is there any basis for *expanding* line sharing obligations to fiber loops, as WorldCom has proposed.[166/] The D.C. Circuit's analysis was in no way limited to any particular type of technology that ILECs may use to deliver their broadband services, as ILECs face the same, robust competition from dominant cable providers and other firms, regardless of whether the ILEC provides broadband services over copper loops or fiber loops. Further, the possibility that ILECs would develop new technologies is a reason not to extend the unbundling requirements. Indeed, the court's observation about the adverse impact of mandatory unbundling on incentives for research and development of new broadband services[167/] makes clear that the Commission

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166/ WorldCom Comments at 105-17.

167/ *USTA*, 290 F.3d at 429 ("[M]andatory unbundling comes at a cost, including disincentives to research and development by both ILECs and CLECs . . . .").

should refrain from imposing unbundling obligations that would thwart those incentives where vigorous competition *already* exists.[168/]

3. CLECs Would Not Be Impaired Without Access to Unbundled DSLAMs.

Under the standards articulated by the D.C. Circuit, CLECs clearly would not be impaired without access to unbundled ILEC DSLAMs. Far from having "cost characteristics . . . [that] render [them] at all unsuitable for competitive supply,"[169/] the Commission already has found that "DSLAMS . . . are available on the open market at comparable prices to incumbents and requesting carriers alike,"[170/] and this remains true today. Moreover, because each DSLAM serves a relatively small number of individual subscriber lines, there are no meaningful economies of scale associated with deploying DSLAMs. Thus, where a CLEC is otherwise positioned to provide DSL service to a customer using an unbundled ILEC loop or subloop, the CLEC would not be impaired in any way by having to provide its own DSLAM to serve that customer.

AT&T's attempt to characterize DSLAMs as providing loop transmission functionality instead of packet switching functionality does not require a different conclusion. Whether DSLAMs provide packet switching functionality or transmission functionality, the same impairment analysis must apply, and as noted above, the Commission has found that DSLAMs are available on the open market to all carriers at comparable prices. Moreover, CLECs can

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168/ In any event, to the extent the Commission were to preserve the line sharing obligation at all, line sharing over *fiber* is not necessary. As noted below, where Qwest has deployed digital loop carrier, CLECs can provide DSL in the same manner that Qwest provides it to its own customers: through remote DSLAM collocation.

169/ *USTA*, 290 F.3d at 427.

170/ *UNE Remand Order*, 15 FCC Rcd at 3836 ¶ 308.

continue to combine their own DSLAMs with unbundled ILEC loops or subloops to provide service to their customers just as they do today. Qwest alone has invested approximately $5 million to ensure that CLECs can do so in more than 1,400 RTs at CLECs' request. Where that is the case, there is no possible justification for concluding that CLECs would be impaired without access to unbundled DSLAMs.

4. CLECs Would Not Be Impaired Without Access to Both the Voice and Data Channels of DLC Loops at the Central Office.

The Commission also should reject AT&T's proposal to require access to the so-called "unified loop" — *i.e.*, access to both the voice and data channels of a next-generation DLC (NGDLC) loop at the central office.[171/] As a preliminary matter, AT&T's proposal is not merely hypocritical in view of its steadfast resistance to sharing its cable broadband facilities with competitors. AT&T's proposal also is anticompetitive, because its adoption would stifle ILEC deployment of broadband facilities and services that compete with AT&T's, both by increasing the costs of such deployment and capping its potential returns.

In all events, the D.C. Circuit's reasons for vacating the *Line Sharing Order* apply with equal force to the "unified loop." The "unified loop" proposal differs from an unbundled, voice-grade loop in that it would create new unbundling obligations, including access to unbundled packet switching, solely to allow CLECs to provide data service in addition to the voice service that they already can provide on unbundled fiber DLC loops. But, as discussed above, broadband data services already are subject to vigorous intermodal competition, and there is no reason to impose such an additional unbundling requirement "under conditions where [there is] no reason to think doing so would bring on a significant enhancement of competition."[172/]

171/ AT&T Comments at 63-64, 165-66.

172/ *USTA*, 290 F.3d at 429.

AT&T's proposal for access to the "unified loop" amounts to little more than another attempt to access unbundled DSLAMs and packet switching, and the Commission should reject this proposal. The "unified loop" proposal would allow CLECs to avoid having to remotely install their own DSLAMs, which must be installed on the copper portion of the loop near the RT, and would give CLECs access to unbundled packet switching. But as explained above, there simply is no basis for the Commission to require ILECs to unbundle DSLAMs, because DSLAMs are available to all carriers on the open market at comparable prices. Likewise, there is no basis for overturning the Commission's prior determination that CLECs would not be impaired without access to unbundled packet switching (except perhaps in the very narrow circumstances identified in the Commission's rules).[173/]

Contrary to AT&T's contention, CLECs can deploy broadband services without access to this so-called "unified loop," using the same architecture that Qwest uses for its own DSL services. AT&T argues that the need for a "physical location where [a CLEC] can deploy its equipment," "power to run the equipment," and a climate controlled environment for its equipment all prevent collocation of DSLAMs at RTs and thus require access to a unified loop,[174/] but AT&T's concerns are overstated. As shown in Attachment C, CLECs can provide advanced services by collocating their own splitters and DSLAMs at a DA hotel located near the serving area interface (SAI) and NGDLC remote terminal (RT), and then purchasing unbundled sub-loops to transport data traffic from the RT to the central office.[175/] Qwest uses this same architecture to provide its own DSL service.

173/ *See* 47 C.F.R. § 51.319(c)(4)-(5).

174/ AT&T Comments at 192.

175/ CLECs also can provide voice services to customers served by NGDLC facilities using the same type of access used for unbundled DLC loops. The universal DLC (UDLC) interface

Qwest now spends approximately $3,400 per RT to build additional space for CLEC DSLAMs and splitters in DA hotels in response to CLECs' continued insistence in various industry forums for at least the past two years that they would be able to provide broadband services over fiber-fed loops using this very architecture. Qwest automatically allows for an additional 15% spare capacity for collocated CLEC DSLAMs and allows a CLEC to request additional space at the planning stage of DA hotel deployments if the CLEC expects to need additional space in a particular area. Thus, Qwest's DA hotel architecture places CLECs on equal footing with Qwest's DSL offering and allows CLECs to offer broadband services on fiber loops. And in areas where the ILEC has copper loops in place that are available to serve a particular customer, the CLEC could obtain the existing copper facilities at the central office to provide both voice and DSL services. The Commission should not impose new, costly requirements on ILECs merely because the CLECs have now decided that they would prefer an alternative architecture for providing service.

B. EELs

For the reasons explained in Part III-B above, the Commission should not require ILECs to unbundle EELs, which are merely combinations of loops and dedicated transport, in markets that satisfy the Commission's pricing flexibility standard. In markets that do not satisfy that standard, the Commission should maintain the existing restrictions on the availability of EELs, including the restriction on co-mingling. CLECs can obtain the same functionality of an EEL by combining unbundled loops that meet the Commission's local service test with ILECs' special access transport. Though this option may be more costly than obtaining the loop and transport at

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allows CLECs to access standalone unbundled loops at the central office without the ILEC first having to route traffic through the ILEC's switch. Thus, the CLEC's DSLAM could route voice traffic back to the ILEC RT for transmission to the central office over an unbundled loop, and the CLEC could then access the voice traffic at the central office as it would any other DLC loop.

UNE prices, this difference in cost alone does not justify a finding of impairment, as discussed above.[176] Moreover, as the Commission has recognized, "permitting the use of combinations of unbundled network elements in lieu of special access services could cause substantial market dislocations and would threaten an important source of funding for universal service."[177] Qwest's forecasts confirm that its special access revenues would decrease significantly if DS1 and DS3 special access services were converted to EELs at current UNE prices.

C. CNAM Databases

Calling Name ("CNAM") databases allow carriers to identify the name of the subscriber associated with a particular phone number and are used to provide services such as Caller ID. CLECs' ability to provide service would not be "impaired" without the "bulk" download of CNAM databases that WorldCom seeks. ILECs currently provide access to their CNAM databases on a per-query basis as required by the Commission's rules.[178] Contrary to WorldCom's contention,[179] this method of access does not materially diminish the ability of CLECs to provide service, nor is it discriminatory in comparison to the manner in which ILECs access their own (or other carriers') databases.

To understand why this is so, it is necessary to understand how CNAM databases work. When a Caller ID subscriber receives an incoming call, the called party's switch performs a database query to match a name to the caller's telephone number. To do that, the switch must

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176/ *See supra* Part I-A-2; *see also Iowa Utils. Bd.*, 525 U.S. at 392; *USTA*, 290 F.3d at 425 n.2 (noting the problems of using UNE prices as the relevant comparison point in the impairment analysis).

177/ Supplemental Order Clarification, *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, 15 FCC Rcd 9587, 9592 ¶ 7 (2000).

178/ *See* 47 C.F.R. § 51.319(e)(2).

179/ *See* WorldCom Comments at 126.

identify the caller's LEC and then send a query to a customer information database containing the caller's information; this is typically accomplished by sending a query through a signal transfer point (STP) connected to the customer information database used by the caller's LEC. Qwest maintains its own CNAM database, and some CLECs in Qwest's service area have arranged for their customer information to be maintained in Qwest's database. Other CLECs maintain their own databases or contract with third parties to maintain databases for them. Thus, a switch seeking to obtain the name of another LEC's subscriber sends a query to the STP connected to whichever database the caller's LEC uses to store its customer names. Because the system of multiple databases requires different carriers' signaling networks to communicate with each other, the industry has developed standard protocols for the SS7 network and calling name delivery service, including the time for providing a query response. Qwest, WorldCom, and other LECs currently use these same SS7 protocols and standards to obtain calling party information on a query basis.

As is clear from this description, there is simply no merit to WorldCom's contention that CLECs must have "access to the CNAM database via batch downloads"[180/] to satisfy section 251's nondiscrimination requirement. *No* single database — whether belonging to an ILEC or any other carrier — contains all carriers' calling-name information. Consequently, *all* LECs must obtain customer name information by submitting queries through the appropriate STP, and that STP may or may not belong to the querying LEC. Indeed, to launch queries to other carriers or providers, Qwest has had to enter into numerous agreements with other carriers and database providers. Yet this system has not prevented Qwest, or any other carrier, from providing Caller ID or related services that require matching names to telephone numbers. WorldCom can hardly

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180/ *Id.* at 125.

complain of discrimination for having to follow the same procedures.[181/] In fact, requiring *ILECs* to provided "batch downloads" of CNAM databases on an unbundled basis under section 251 would not guarantee WorldCom the ability to create the single, national CNAM database that WorldCom apparently seeks, because such an unbundling requirement would not apply to *CLECs*.

Even if a CLEC sought to compile its own national directory of customer names, the CLEC would have numerous alternatives to obtaining bulk downloads of CNAM databases from individual ILECs.[182/] For example, many CLECs have constructed calling-name databases from directory assistance lists (DALs) and subscriber list information that is currently available from other sources. Indeed, as the Commission recognized in the *UNE Remand Order*, the directory assistance database market is competitive, with several providers offering such storage service.[183/] Like these alternative providers, a CLEC could create its own comprehensive caller information database, or contract with these independent database providers to obtain calling name information from them — as many CLECs in fact already do. And there is no reason to believe that a CLEC could not structure such a database so that it could perform queries by telephone number (for Caller ID and related services) *or* name (for directory assistance). Consequently, there is no basis for concluding that, without unbundled access to "batch downloads" from ILEC CNAM databases, CLECs would be unable to offer services using a single caller information database.

181/ Nor is a single database necessary to ensure that queries can be completed on time, as WorldCom contends. *Id.* at 125. The current system was designed specifically to allow carriers to obtain the necessary information from database queries in time to be displayed to customers.

182/ As noted above, there is no existing CNAM database that contains comprehensive, national listings.

183/ *See UNE Remand Order*, 15 FCC Rcd at 3894-95 ¶¶ 447-49.

Similarly, there is no merit to WorldCom's claim that batch access to CNAM is necessary to support "innovative services" such as TCP/IP signaling that would allow a CLEC to provide caller ID service for voice-over-IP applications.[184/] First, no carrier or vendor has developed a database architecture that, when populated with CNAM data obtained from batch downloads, would be capable of supporting CNAM queries using TCP-IP signaling. Second, WorldCom has not demonstrated that competitively-available sources of subscriber databases such as DALs would be insufficient to support any "innovative services."

WorldCom also has not demonstrated that, without bulk access to the ILECs' CNAM databases, CLECs would incur costs that materially diminish their ability to compete. To the contrary, a CLEC likely would incur substantial costs to develop a comprehensive database using bulk access to CNAM databases. At a minimum, the CLEC would need to construct its own database to hold that data. These costs would be in addition to the costs of obtaining the database information and all continuing updates to that database. WorldCom has not presented any evidence that these costs would be lower than the costs of accessing ILECs' CNAM databases on a per-query basis. Moreover, the CLEC would still have to query its own database, and WorldCom has provided no evidence that these costs would be lower than the costs of querying ILEC databases. Indeed, whether WorldCom has its own database or accesses Qwest's database, it still must maintain signaling bridge links between its own STP and its calling-name database. A CLEC that does not currently have such a database would have to establish those links at its own expense. The CLEC also would have to retain its signaling links with the ILEC to handle exchange of routine voice traffic. Thus, there is no basis to conclude that a CLEC

184/ WorldCom Comments at 126.

could achieve any cost savings from creating and maintaining a comprehensive database using bulk access to ILEC CNAM databases.

The state commission proceedings cited by WorldCom in its comments do not support a different conclusion. WorldCom's references to proceedings in Arizona and Georgia are most telling. Although the Arizona Corporation Commission staff (and subsequently the Commission itself) determined that bulk access to CNAM databases was technically feasible, that commission found that CLECs would *not* be impaired without bulk access to Qwest's CNAM database.[185/] Likewise, the Georgia Public Service Commission reversed the initial ruling cited by WorldCom in its comments and held that BellSouth need provide access to its CNAM database only on a "per query" basis.[186/] Indeed, the overwhelming majority of state commissions in Qwest's region, as well as a number of other state commissions in other regions, have recommended *rejection* of WorldCom's request for "batch downloads" from the CNAM database.[187/]

185/ Second Supplemental Report on Qwest's Compliance, *Qwest Communication, Inc.'s Section 271 Application*, Docket No. T-00000A-97-0238 (Ariz. Corp. Comm'n Feb. 28, 2002); *see also In re U. S. WEST Communications, Inc.*, Docket No. T-00000A-97-0238, ¶ 40 (Ariz. Corp. Comm'n May 21, 2002).

186/ Order on Disputed Issues, *In re MCIMetro Access Transmission Services, LLC*, Docket No. 11901-U (Sept. 18, 2001).

187/ *See, e.g.*, Slip Opinion, *In re U S WEST Communications, Inc.*, Docket No. 97I-198T (Colo. Pub. Utils. Comm'n June 22, 2001); Slip Opinion, *In re Qwest Corporation*, Util. Case No. 3269 (N.M. Pub. Reg. Comm'n July 31, 2001); Slip Opinion, *In re Qwest Corporation*, Docket No. 70000-TA-00-599 (Record No. 5924) (Wyo. Pub. Serv. Comm'n June 25, 2001); Slip Opinion, *Re Pacific Bell Telephone Company*, Docket No. A.01-01-010 (Cal. Pub. Utils. Comm'n Sept. 20, 2001); Slip Opinion, *In re MCImetro Access Transmission Servs. LLC*, Docket No. 000649-TP PSC-01-0824-FOF-TP (Fla. Pub. Serv. Comm'n Mar. 30, 2001); Slip Opinion, *In re MCImetro Access Transmission Servs. LLC*, Case No. TO-2002-222 (Mo. Pub. Serv. Comm'n Feb. 28, 2002).

IV. THE COMMISSION SHOULD CLARIFY THE PROPER APPLICATION OF TELRIC TO PREVENT USURPATION OF ITS ORIGINAL OBJECTIVE: RATIONAL ECONOMIC PRICE SIGNALS.

The Commission does not conduct the section 251(d)(2) "impairment" inquiry in an analytical vacuum. As the *USTA* Court indicated, the list of UNEs subject to unbundling under section 251(d)(2) is of a piece with "the *prices* at which CLECs get access to UNEs."[188/] The *Notice* likewise notes this close relationship and seeks comment on whether the Commission should "clarify or modify [its] pricing rules."[189/] Indeed, during the six years since the issuance of the *Local Competition Order*, the Commission has undertaken no systematic, national effort to clarify the proper application of its TELRIC pricing methodology in the UNE rate-setting context. Particularly now that TELRIC as such is no longer the subject of litigation, the time is ripe for the Commission to provide further guidance on how to apply it. The Supreme Court reviewed and affirmed TELRIC as it was originally conceived, not as it has been applied in the states, and the Court certainly did not keep the Commission from either improving on TELRIC or clarifying its proper implementation.

The need for such guidance has now become particularly acute. In recent years, non-facilities-based CLECs and many states have treated TELRIC not as the economically objective replacement-cost methodology the Commission intended, but as a mandate to lower rates to produce "the widest unbundling possible" and trigger the "completely synthetic competition" (in effect, a form of resale) that the D.C. Circuit recently disparaged as incompatible with the statutory design.[190/] This, however, was never the point of TELRIC to begin with. Instead, the

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188/ *USTA*, 290 F.3d at 425 n.2.

189/ *Notice*, 16 FCC Rcd at 22793 ¶ 24.

190/ *USTA*, 290 F.3d at 424-25.

Commission designed its cost methodology to be, as "Congress intended, *pro-competition*" rather than "*pro-competitor.*"[191] To that end, the "essential objective" of TELRIC "is to determine what it would cost, in *today's* market, to replace the functions of [a network] asset that make it useful,"[192] while simultaneously taking as given "the most basic geographical design of the existing network"[193] and all real-world constraints outside the network (such as right-of-way restrictions and paved roads).

In key respects, non-facilities-based CLECs such as AT&T have persuaded the states to ignore those principles. For example:

- Some states assume, for purposes of determining cable placement costs, that many of the roads in highly developed areas are unpaved (even though they are not) and then estimate digging costs on that basis. These states have accepted AT&T's claim that, under TELRIC, it is wrong to assume that "all physical structures are currently in places they are today" — and that it is right to assume instead that a replacement carrier could go back in time and place cable in the ground "before structures such as roads and landscaping are already in place."[194]

- Some states assume that, *every time* an efficient carrier places a new cable that requires digging a trench in downtown urban areas (or even already-developed suburban and rural areas), some other utility will appear on the scene and agree to split the costs of cutting through asphalt 50-50 so that it may deploy its own, unrelated facilities simultaneously. These states make that assumption even though, as all acknowledge, "other utilities" have

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191/ *See* First Report and Order, *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, 11 FCC Rcd 15499, 15812 ¶ 618 (1996) ("*Local Competition Order*") ("The price levels set by the state commissions will determine whether the 1996 Act is implemented in a manner that is *pro-competitor* . . . or, as we believe Congress intended, *pro-competition.*") (emphasis in original).

192/ Br. for Petitioners FCC and United States, *Verizon Communications Inc. v. FCC*, No. 00-511 and consolidated cases, at 6 (filed April 2001) ("FCC 2001 S. Ct. Br.") (emphasis added).

193/ *Id.* at 9.

194/ Response of AT&T and XO to Qwest's Exceptions, *Investigation into U S West Communications, Inc.'s Compliance with Certain Wholesale Pricing Requirements for Unbundled Network Elements and Resale Discounts*, Docket. No. T-00000A-00-0194, at 13 (Ariz. Corp. Comm'n Feb. 1, 2002) ("AT&T AZ Br.").

already deployed most of their facilities in these and other developed areas — and even though the savings from sharing, *including in undeveloped areas,* is typically below 20%.

- The HAI (and its predecessor the Hatfield) cost models, sponsored by CLECs and adopted by states inside and outside of Qwest's territory, represents the world in a simplified form that omits many of the features of the real world that make it costly to deploy a telecommunications network. An extreme example is Arizona's use of a newly-developed optional HAI model network design algorithm that purports to estimate the distance for connecting points or customers. The practical effect of using that algorithm is to assume that a given serving area has no obstructions such as houses, yards, office buildings, or right-of-way restrictions that could interfere with the cheap deployment of telephone lines.

- CLECs have advocated, and some states have adopted, trivial non-recurring charges for labor-intensive activities such as coordinated loop cutovers ("hot cuts"). The premise underlying this denial of compensation for the use of skilled labor is the theory that hot cuts and similar activities "will" be fully automated "in a forward-looking environment," even though there is not now, and probably never will be, technology available to make that theory a reality.

In combination, these violations of TELRIC principles produce a grotesque methodological amalgam that simultaneously (1) lurches *back* in time to pre-development days, when streets were dirt, digging was cheap, and other utilities supposedly shared the costs, but without accounting for other factors that increased costs in the past; (2) lurches *forward* in time to the unforeseeable future, when the technology is invented that allows CLECs and ILECs to solve complex network coordination problems with little or no human involvement, but without accounting for the costs of developing that technology; (3) ignores facts *outside* the existing network that should be taken into account, such as homes, office buildings, and other inconvenient obstructions; and (4) ignores facts about the existing network that *should* be taken into account, such as an ILEC's actual experience in different areas finding other utilities to help share placement costs.

Indeed, the only common theme unifying this hodge-podge of TELRIC violations is that the result in each case is a material reduction both in the ILEC's UNE rates and in the incentives of CLECs to invest in facilities of their own. Although the "cost" standard of section 252(d)(1)

may be susceptible to a broad variety of permissible readings, it plainly forbids this jerry-rigged patchwork of incompatible, price-slashing assumptions. Moreover, these methodological lapses have enormous economic consequences. In Arizona, for example, the net result of such errors is an arbitrary reduction of more than four dollars (roughly 25%) in the statewide average recurring loop rate.[195/] The resulting distortion of economic signals is a matter of profound practical as well as theoretical concern. As one prominent industry analyst has observed, when "Government set[s] wholesale local prices below real cost," as it is increasingly tempted to do, it "poison[s] prospects for economically sound facilities investment" and "contribute[s] to the destruction of companies, jobs, and shareholder wealth by discouraging economic investment and rewarding uneconomic investment."[196/]

Another reason the Commission needs to step in at this point is that, often with considerable success, CLECs seek to justify these errors on the ground that the Commission itself has adopted them in its universal service cost model (the "Synthesis Model" or "SM").[197/] As noted below, the Commission has confirmed several times that particular SM inputs (such as those relating to switch-related "growth additions" and fill factors) are substantively inappropriate for UNE rate-setting purposes. The Commission should now more generally identify the other SM inputs that, *when used as tools for setting UNE rates*, violate the core

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195/ Qwest Corporation's Exceptions to the Administrative Law Judges' Recommended Opinion And Order, *Investigation into US West Communications, Inc.'s Compliance with Certain Wholesale Pricing Requirements for Unbundled Network Elements and Resale Discounts*, Docket No. T-00000A-00-0194, Exh. D (Ariz. Corp. Comm'n Dec. 12, 2001) ("Qwest AZ Exceptions Br.").

196/ Scott C. Cleland, *Why De-Regulation Is Now The Dominant Telecom Trend/Theme*, Precursor Group Independent Research (Nov. 28, 2001).

197/ *See* Tenth Report and Order, *Federal-State Joint Board on Universal Service*, 14 FCC Rcd 20156, 20202 ¶ 100 (1999) ("*Inputs Order*"), *aff'd sub nom., Qwest Corp. v. FCC*, 258 F.3d 1191 (10th Cir. 2001).

purposes of TELRIC. It is not enough for the Commission to continue admonishing the states that they are not *required* to rely on the SM's inputs in state cost proceedings. That language has proven inadequate to address the problem, because states understand it to mean that they are at least permitted to use the SM inputs,[198] often without conducting any further inquiry into their validity for UNE rate-setting purposes. Instead, the Commission should identify for the states the specific respects in which specific SM inputs cannot be used in UNE rate proceedings without violating the original purpose of TELRIC: the creation of economically rational price signals.[199]

A. TELRIC's Purpose Is to Determine Replacement Costs for Network Facilities, not to Promote the Widest Possible Use of the UNE Platform.

As the Commission recently told the Supreme Court, the "essential objective" of TELRIC "is to determine what it would cost, in *today's* market, to replace the functions of [a network] asset that make it useful," while simultaneously taking as given "the most basic geographical design of the existing network."[200] The point of TELRIC is not to imagine that the

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198/ *See, e.g.*, Phase II Opinion and Order, *Investigation into Qwest Corp.'s Compliance with Certain Wholesale Pricing Requirements for Unbundled Network Elements and Resale Discounts*, Docket No. T-00000A-00-0194, at 17 (Ariz. Corp. Comm'n 2001) ("*Arizona Phase II Order*") (citing the *Inputs Order* in support of decision to adopt the HAI fill factors); Slip Opinion, *In re Investigation Into Pricing of Unbundled Network Elements*, Docket No. 990649-TP PSC-01-1181-FOF-TP (Fla. Pub. Serv. Comm'n May 25, 2001) ("[T]he [fill factor] inputs from the Universal Service docket are appropriate here."); *see also* Slip Opinion, *In re Nevada Bell* (Nev. Pub. Serv. Comm'n Feb. 01, 1999) (adopting HAI fill factor inputs, which are the same as the SM inputs in many cases); Slip Opinion, *In re Southern New England Telephone Company*, Docket No. 00-01-02, (Conn. Dept. Pub. Util. Control June 29, 2000) (noting that Office of Consumer Counsel's proposal to use FCC's fill factors "has merit").

199/ As discussed below, even though SM inputs are often inappropriate for purposes of setting *absolute* rate levels in UNE rate proceedings, that does not mean that the SM's output is inappropriate for the quite different purpose of comparing the *relative* costs of different states. When used for the latter purpose, the SM's input errors can cancel each other out, at least to some extent.

200/ FCC 2001 S. Ct. Br. at 6, 9 (emphasis added).

world itself will be recreated from the void with an eye towards lowering prices for UNE-P resellers. Nor is it the point of TELRIC to imagine futuristic technological capabilities that exist only on chalkboards and not in the market.

Instead, TELRIC asks what facilities would be "currently available"[201/] to an efficient carrier seeking to replace the existing network given the constraints of the rest of the world as they exist *today*. Taking such constraints into account is integral to the basic purpose of TELRIC, which is to "replicate[], to the extent possible, the conditions of a competitive market."[202/] By replicating those conditions, TELRIC is meant to give CLECs appropriate price signals about when it would be efficient, and when inefficient, to build their own facilities rather than leasing the incumbents' existing capacity.[203/]

As discussed in Section I, the ultimate objective of the 1996 Act is true facilities-based competition, as the Commission has recognized; Congress did not intend to create a regime in which all carriers use exactly the same network and compete about nothing but marketing and salesmanship. Such a regime benefits only non-facilities-based CLECs (in effect, resellers) and telemarketing firms. "Through its experience over the last five years in implementing the 1996 Act, the Commission has learned that only by encouraging competitive LECs to build their own facilities or migrate toward facilities-based entry will real and long-lasting competition take root in the local market."[204/]

201/ 47 C.F.R. § 51.505(b)(1).

202/ *Local Competition Order*, 11 FCC Rcd at 15846 ¶ 679.

203/ *See id.* at 15813 ¶ 620, 15848-49 ¶¶ 683-85.

204/ Fourth Report and Order, *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, 16 FCC Rcd 15435, 15437 ¶ 4 (2001); *see also* Notice of Proposed Rulemaking, *Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services*, 16 FCC Rcd 22745, 22777 (2001) (Separate Statement of

That is why, in applying TELRIC, it is so critical to set UNE prices based on "currently available" technology and on current constraints in the rest of the world outside the network, as the Commission originally intended. If regulators were to move the inquiry forward or back in time in an effort to reduce estimated replacement costs, they would distort the price signals TELRIC is designed to send and would undermine any incentive a CLEC might have to invest in facilities of its own. In a nutshell, no carrier would ever build facilities at today's rates, with the constraints of today's world, if it could instead lease facilities at rates reflecting the lower costs of yesterday or tomorrow.

These reply comments take no issue with TELRIC on its own terms, as originally conceived, and focus instead on the various respects in which TELRIC has been misapplied to effect arbitrary reductions in UNE rates that could devastate the prospects for facilities-based competition. This is not to suggest that TELRIC *itself* is immune from constructive criticism. For example, to the extent that TELRIC requires regulators to assume that *all* components of a forward-looking network embody the very latest technology available, that assumption is questionable, because *any* carrier, however "efficient," would require some time interval over which to build its "forward-looking" network or, alternatively, to incorporate new technology into an existing network. Thus, even a hypothetical "most efficient" carrier in a perfectly competitive market would have to make do with a mix of current and somewhat less current technology, and that fact is relevant to a proper determination of forward-looking costs.[205/]

Chairman Michael K. Powell) (stressing Commission's "ongoing commitment to the promotion of facilities-based competition").

[205/] *See generally* Testimony of Howard Shelanski on Behalf of Verizon Virginia Inc., *Petition of WorldCom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Expedited Preemption of the Jurisdiction of the Va. State Corp. Comm'n Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration*, CC Docket No. 00-218 et al., at 8-21 (filed July 31, 2001).

Moreover, although the only feature of the existing network that TELRIC requires taking as given is the location of "existing wire centers," the Commission has correctly acknowledged that it "might reasonably have drawn the line somewhere else within the structure of the network."[206/] For example, the Commission could have required taking as given not just existing wire center locations ("scorched node"), but also the major transport and feeder routes ("scorched conduit"). Again, however, these reply comments address the proper application of TELRIC as originally conceived in the *Local Competition Order*, not how TELRIC itself could be further improved.

Finally, although these comments focus on inputs that are specific to certain key rate elements, two more general inputs — depreciation and cost of capital — warrant brief discussion at the outset. Of particular significance are the Commission's own recent representations to the Supreme Court. In response to Verizon's concern that ordinary straight-line depreciation would "preclude a carrier from ever recovering its full forward-looking costs" because "the forward-looking costs of some facilities will predictably decrease over their expected lives," the Commission explained that state commissions could "adopt accelerated depreciation schedules that provide faster recovery of incumbents' forward-looking costs at the beginning of the relevant period than at the end, or state commissions could choose some other method of ensuring adequate recovery of forward-looking costs."[207/] The Commission also downplayed concerns about its "tentative guidance" in 1996 that "'reasonable starting point[s] for TELRIC calculations'" included "the depreciation schedules and cost of capital determinations that were set under prior historical-cost ratemaking regimes" before the advent of local competition and its

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206/ Reply Br. for Petitioners FCC and United States, *Verizon Communications Inc. v. FCC*, *supra*, at 5 (filed July 2001) ("FCC Supreme Court Reply Br.").

207/ *Id.* at 10-11.

attendant risks.[208] As the Commission explained, "[t]hat [1996] statement does not alter the governing standard, set forth in the rules, that requires state commissions to determine the true economic depreciation rate and risk adjusted cost of capital."[209]

As the Commission is aware, however, that "governing standard" is often sacrificed in the name of ginning up additional UNE-platform competition, even though such "completely synthetic competition"[210] is little more than a cut-rate form of resale. The time has thus come for the Commission to enforce this "governing standard" through more explicit guidance. First, the Commission should direct the states to ensure analytical consistency within TELRIC by assuming a competitive market not just for purposes of determining the costs of the underlying investments, but also for purposes of determining cost of capital. The issue is not how much of the market an *ILEC* occupies at any given time, but what the cost of capital would be for an efficient carrier in a truly competitive market. That figure is significantly higher than the 11.25% "starting point" the Commission adopted in the *Local Competition Order* — a legacy figure that assumes very little competition at all — and is closer to the 12.95% figure applicable to S&P Industrial group companies in competitive markets.[211] Similarly, as the Commission

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208/ *Id.* at 11 (quoting *Local Competition Order*, 11 FCC Rcd at 15856 ¶ 702).

209/ *Id.* at 12; *see* 47 C.F.R. 51.505(b)(2) and (3). In response to the Commission's assurances on this point, the Supreme Court held that the Commission's 1996 guidance was "reasonable enough" because it treated "then-current capital costs and rates of depreciation as mere starting points, to be adjusted upward if the incumbents demonstrate the need." *Verizon v. FCC*, 122 S. Ct. at 1677.

210/ *USTA*, 290 F.3d at 424.

211/ Direct Testimony of Dr. James H. Vander Weide on Behalf of Verizon Virginia Inc., *Petition of WorldCom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Expedited Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration*, CC Docket No. 00-218, at 44-48 (filed July 31, 2001).

itself has acknowledged, "an appropriate cost of capital determination takes into account not only existing competitive risks . . . but also risks associated with the regulatory regime to which a firm is subject" — including the uncertain application of TELRIC itself.[212/]

As to depreciation, the Commission should reaffirm that the states must "adopt accelerated depreciation schedules" or "some other method of ensuring adequate recovery of forward-looking costs" to account for the periodic recalculation of the forward-looking cost of network facilities (and the attendant assumptions about network replacement with each recalculation) during their useful lives; otherwise, as the Commission has effectively acknowledged, ILECs will never recover even the forward-looking costs of most network assets by the end of the relevant depreciation periods.[213/] Finally, the Commission should direct the states to base their determinations of depreciation lives on the figures used for financial reporting purposes, not their obsolete regulatory counterparts.

B. The Commission Should Clarify That, to Send Appropriate Price Signals, TELRIC Asks How Much it Would Cost *Today* to Replace the Functions of Network Facilities, Taking as Given the Rest of the World *Outside* the Network.

With some success, non-facilities-based CLECs have urged the states to indulge wildly counterfactual assumptions that either (1) move the replacement cost inquiry alternatively back or forward in time without fully accounting for the costs of doing either or (2) ignore the unavoidable constraints *outside the network* that any replacement carrier would confront in the real world. The objective of these CLECs is clear: they wish to find some pretext for lowering UNE rates below cost as a means of generating additional UNE platform margins for residential customers currently served at subsidized rates, while avoiding the need to make prudent

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212/ FCC Supreme Court Reply Br. at 12 n.8.

213/ *Id.* at 10-11.

investments of their own. What follows is not a comprehensive list of such TELRIC violations, but it does provide illustrative examples of the problem.

1. Cable Placement Costs and Structure Sharing.

"Cable placement costs" are the costs of placing telephone cable in trenches or conduit, or on poles. These labor-intensive costs, along with the costs of splicing and other labor-related activities, are the largest component of a carrier's outside plant costs. To reflect these costs accurately, any cost model must address two discrete inputs: (1) the magnitude of the placement costs themselves, and (2) the extent to which an efficient carrier rebuilding the network today would be able to save on placement costs by sharing them with other utilities (such as electric utilities or cable companies) that might wish to dig up the ground and lay facilities of their own at the same time. As to the first of these inputs, the basic dispute concerns the relative frequency among the more and less expensive methods that such a carrier would use to cut through the ground to lay the cable. It is far costlier to lay cable in developed areas than in undeveloped areas, because it is expensive to cut through asphalt or concrete and then restore it to its original condition. Similarly, "sharing" opportunities are quite limited in developed areas, because the utilities that might otherwise have an interest in finding such opportunities have already deployed most of their underground facilities in those areas: indeed, that is part of what it means for an area to be "developed."

Many states treat already-developed areas, and particularly the highest density areas (which are the *most* developed), as though they were *undeveloped* for these purposes. For example, Colorado attributes to the replacement carrier a need to cover barely half of the trenching costs in these zones, hypothesizing that other utilities would pay the remainder of those

costs.[214] Put differently, these states assume that *every time* the replacement carrier would incur the significant costs of digging into asphalt to lay its cable, some other utility would appear on the scene and agree to split those costs down the middle. Some states, such as Arizona, Tennessee and West Virginia, take this one step further and assume that trenching costs are shared 50-50 in *all* areas.[215] But this does not happen in the real world: carriers — ILECs and CLECs alike — normally bear the overwhelming burden of their own trenching costs in downtown urban areas. Similarly, states such as Arizona assume that, much of the time, a replacement carrier could employ relatively inexpensive digging techniques, such as simple "plowing," in downtown urban areas.[216] The problem, of course, is that asphalt and concrete

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[214] Order, *U S WEST Communications, Inc.'s Statement of Generally Available Terms and Conditions*, Docket No. 99A-577T, at 40 (Colo. Pub. Utils. Comm'n Apr. 17, 2002) (adopting a 55% structure sharing input for buried and underground cable in the three highest density zones); *see also* Order, *Universal Service*, Order No. 00-312, 2000 WL 1055227 *13-14 (Or. Pub. Utils. Comm'n 2000) (adopting the Synthesis Model's structure sharing assumptions, including a 55% buried structure sharing factor in the highest density zone); Order Adopting Permanent Prices for Unbundled Network Elements, *Unbundled Network Elements*, Docket No. P-100, Sub 133d, 1998 WL 995837 (N.C.U.C. 1998) (same); Report and Order, *Bell Atlantic-Rhode Island Telric Study*, Order No. 16793, 2001 WL 1822706 *21-22 (R.I. Pub. Utils. Comm'n 2001) (adopting Bell Atlantic's structure sharing assumptions but also adopting a presumption in favor of using USF inputs in future TELRIC proceedings).

[215] *See, e.g., Arizona Phase II Order* at 14 (adopting 50% structure sharing input for buried and underground cable); Interim Order on Phase II of Universal Service, *Universal Service Proceeding*, Docket No. 97-00888, Issue 16e, 1999 WL 983424 (Tenn. Reg. Auth. 1999) (adopting the assumption that, for buried distribution cable, "one other entity [would] shar[e] [costs] with the ILEC"); Order on Arbitration, *Bell Atlantic West Virginia, Inc. Petition to establish a proceeding to review the Statement of Generally Available Terms and Conditions offered by Bell Atlantic in accordance with Sections 251, 252, and 271 of the Telecommunications Act of 1996*, Case No. 96-1516-T- PC at 47 (P. S. C. of W. Va. 1997) (adopting a 50% sharing factor for buried cable).

[216] *See Arizona Phase II Order* at 11-12 (concluding "that an appropriate cost model" should not assume that "the majority of placement activities would require that streets, sidewalks, and landscaping would need to be cut and restored or bored").

cannot be "plowed," and municipalities require all carriers to perform restoration after cutting into streets and sidewalks.

How do the non-facilities-based CLECs (and states) rationalize this deviation from reality? The key is that they do not ask, as TELRIC requires, how much trench sharing a carrier could expect, or what placement methods it would use, if it were to deploy a complete replacement network in the world as it exists today. Indeed, in addressing both cable placement costs and sharing percentages, CLECs argue for, and some states endorse, an entirely different inquiry: what it *would have* cost a carrier to replace current network facilities *years ago*, back before business and residential development both (1) made cable placement more costly (because obstacles require more expensive digging methods) and (2) reduced savings from the sharing of trenching costs (because sharing of trenches with developers or other utilities typically occurs, if at all, when multiple carriers simultaneously seek to place cables for the first time in new developments, and even then is not always feasible due to difficulties and costs associated with coordinating construction schedules).[217/] In effect, this perversion of TELRIC permits and even requires the use of historical costs whenever they would be lower than the costs of the corresponding input today. That is not merely arbitrary, but wholly inimical to TELRIC's original aim of sending the proper signals for make/buy decisions.

217/ In this regard, trench sharing is quite different from pole sharing. Because it is impractical (and indeed dangerous) to leave trenches open for extended periods of time, trench sharing requires multiple carriers to coordinate their construction schedules so that their crews are available to place cables in an open trench within the same short period (typically, no more than three or four days). The complexities of coordinating construction crews from multiple carriers, as well as the costs of rearranging construction schedules so that they coincide with those of other carriers, often can limit actual sharing even in new developments. By contrast, pole sharing does not require such precise coordination, because cables can be placed on poles at any time after a pole has been installed without requiring additional costs.

TELRIC, however, is not a time machine. As noted, the Commission itself has explained that "[t]he essential objective" of TELRIC or any other forward-looking cost methodology "is to determine what it would cost, *in today's market*, to replace the functions of an asset that make it useful."[218/] Basing placement costs or sharing percentages on yesterday's conditions, in contrast, is not forward-looking, but *backward*-looking, and as such it is the very antithesis of TELRIC. Although TELRIC entitles CLECs to many advantages an ILEC lacked when it built the network, it does not entitle CLECs to wish away present-day concrete and asphalt, just as it does not entitle them to pretend that labor is as cheap today as it was decades ago when much of the trenching for today's network was done. Indeed, if TELRIC permitted this retrospective analysis, a CLEC would never have any incentive to build its own facilities, because, through cheap access to UNEs, it could always take advantage of the lower costs incurred in the old days when, according to the legend, the digging was easy and everyone shared.

Lacking any coherent justification for this approach in logic, CLECs and the states alike have taken to rote citations of a sentence in a footnote of the *Inputs Order* that, at least taken out of context, appears to support this very methodological error.[219/] In Arizona, for example, AT&T successfully defended this approach on the ground that it "specifically follow[s] [a]

[218/] FCC 2001 S. Ct. Br. at 6 (emphasis added). Of course, TELRIC asks what it would cost to replace the entire network, in both developed and undeveloped areas, not just what it would cost to add on to the embedded network in undeveloped areas. Indeed, the CLECs themselves seek UNEs in all areas and primarily in developed ones, where the roads are already paved and other utilities have already laid cable.

[219/] *Inputs Order*, 14 FCC Rcd at 20261 ¶ 244 n.504 ("[A]s part of the logical argument that the entire telephone network is to be rebuilt, it is also necessary to assume that the telephone industry will have at least the same opportunity to share the cost of building plant that existed when the plant was first built."). At the same time, the FCC questioned the relevance of this issue to its own inquiry for purposes of the SM, noting that, "[w]hile this [issue] may provide an interesting topic for academic debate, we do not believe it to be particularly useful or relevant in determining the structure sharing values in this proceeding." *Id.*

methodology adopted by the FCC in performing its own analysis of forward-looking costs."[220] AT&T explained that, whereas "[t]he Qwest model . . . designs outside plant by first assuming that all physical structures are currently in places they are today and then choosing placement activities that would be required to place the cable in and around obstacles," the AT&T model, like the SM itself, assumes cable would be buried "whenever possible before structures such as roads and landscaping are already in place."[221] "The FCC," AT&T concluded, "agrees with this approach."[222] Of course, AT&T champions this TELRIC error because it has the effect of ignoring the constraints that *any* efficient carrier would incur in building its own facilities in developed areas *today* — and thus deprives CLECs of any incentive to make such investments.[223] Through such distortion, AT&T achieved an arbitrary reduction of more than $2.00 total in the statewide average loop rate, or nearly 15%.[224]

Placement costs and sharing percentages are but two examples of inputs that the states have misapplied in reliance on analogous assumptions found in the SM. Two more are briefly mentioned here: network routing assumptions and fill factors.

220/ AT&T AZ Br. at 1.

221/ *Id.* at 13.

222/ *Id.*

223/ The Colorado commission recently accepted the same "aggressive" approach to these inputs as well even though it acknowledged the merit of Qwest's position. *See* Ruling on RRR Applications, *US West's Statement of Generally Applicable Terms and Conditions*, Docket No. 99A-577T, at 31 (Apr. 17, 2002) ("Qwest may have some grounds in arguing such an assumption is fanciful in terms of what real forward-looking costs will be. Nevertheless, the TELRIC assumptions of the HAI model and of other states' TELRIC prices seem to accept these aggressive assumptions, about both sharing and existing infrastructure.") (citation omitted).

224/ Adopting the CLECs' structure sharing assumptions in Arizona reduces monthly recurring loop rates by more than $1, as does adopting the CLECs' assumptions about cable placement costs. *See* Qwest AZ Exceptions Br., Ex. D.

2. Network Routing Shortcuts.

Some states, again relying on the SM or on CLEC-sponsored cost models, compound their other input errors by assuming away real-world obstacles that increase the replacement costs of existing network facilities. One of the key steps in determining total loop investment is a calculation of the amount of "distribution plant" needed to reach individual customers. A distribution facility is the final portion of the loop closest to the customer: the so-called "last mile to the home" (although such facilities may of course be longer or shorter than a mile). Like the outer branches on a tree, they are the most geographically dispersed of the loop facilities, and their deployment requires enormous investment. The degree of that investment depends on several key factors, one of which is the extent to which various obstructions in the real world get in the way of otherwise efficient network distribution paths.

Certain cost models understate distribution plant investment by partially or completely ignoring such obstructions — or even the location of roads and other rights of way where cable can be placed. That is particularly true of the CLEC-sponsored HAI model, used in the great majority of Qwest states, as well as in a number of other states.[225/] This problem was recently

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225/ *See, e.g., Arizona Phase II Order* at 10; Slip Opinion, *In re U S West Communications, Inc.*, Docket No. RPU-96-9 (Iowa Utils. Bd. Apr. 23, 1998) (adopting HAI's predecessor, the Hatfield model); Slip Opinion, *In re Universal Service Support*, Docket No. P-999/M-97-909 (Minn. Pub. Utils. Comm'n 1999) (adopting HAI model despite analysis showing that the model failed to account for enough cable to connect numerous customer locations); Slip Opinion, *Re Implementation of the Texas High Cost Universal Service Plan*, PUC Docket No. 18515 (Tex. Pub. Utils. Comm'n 2000) (adopting the HAI model based on the assumption that the treatment of unidentified customers would offset the model's tendency to underbuild the network); Order, *Petition to Establish a Proceeding to Review the Statement of Generally Available Terms and Conditions Offered by Bell Atlantic in Accordance with Sections 251, 252 and 271 of the Telecommunications Act of 1996*, Case No. 96-1516-T-PC, at 61 (W. Va. Pub. Serv. Comm'n May 16, 1997) (adopting an outdated version of the Hatfield model "even though there are later, perhaps more accurate, versions of the model"). *But see Re Bell Atlantic*, DE 97-171, Order No. 23738, 210 P.U.R.4th 363 (N.H. Pub. Utils. Comm'n 2001) (rejecting the HAI model because it "ignor[es] the actual methods by which any carrier would produce a network" and "underbuilds the network").

taken to its absurd conclusion in Arizona, where the proponents of the HAI model have successfully introduced an alternative routing algorithm that produces substantially less cable than even the original HAI model did.[226/] This alternative algorithm attempts to estimate the distances required to connect customer locations as if they were dots on a blank page. It is not a method that any telecommunications engineer would ever use to design a distribution network. In the real world, customers are not dots on a blank page, and distribution networks must be designed around rivers, buildings, yards, highways, protected lands, and other natural and man-made obstructions. By adopting this alternative algorithm, the Arizona commission has assumed those obstructions away, artificially lowering urban distribution distances by as much as two-thirds, and thereby reducing statewide average loop rates by approximately $1.00.[227/] But non-facilities-based CLECs have succeeded in persuading at least one state regulator that the FCC's use of a similarly-named algorithm within the universal service cost model somehow supports the use of their own algorithm in a completely different model for the quite different purpose of estimating UNE costs.[228/]

3. Fill Factors

A "fill factor" is a cost study input reflecting the percentage of a facility's capacity that, on average, is utilized when the facility is efficiently deployed within the network. The higher a facility's fill factor is, the less spare capacity is deemed to be in place over a given time period.

226/ *See Arizona Phase II Order* at 21-22.

227/ Qwest AZ Exceptions Br., Ex. D; *see also* Order, *U S WEST Communications, Inc.'s Statement of Generally Available Terms and Conditions*, Docket No. 99A-577T, at 42 (Colo. Pub. Utils. Comm'n Nov. 13, 2001) ("*Colorado SGAT Order*") (rejecting the HAI's MST function on the grounds that "TELRIC does not require ignoring other real world limitations or sources of network placement costs such as buildings, rivers, lakes, etc.").

228/ *See Arizona Phase II Order* at 21-22.

That, in turn, results in lower UNE rates for any *given* increment of capacity, because the costs of spare capacity allocated to each working unit are lower. Fill factors are a critical input for a broad variety of network elements ranging from switching to loop distribution facilities to high-capacity circuits such as dedicated transport and DS1 or DS3 loops.

Routinely citing the SM for support, the CLECs have proposed unrealistically high fill factors for all such elements,[229/] sometimes with considerable success. For example, the HAI model assumes a default of 98% fill factor for switching,[230/] even though that would include only enough spare capacity to accommodate the need for "administrative fill" (*i.e.*, enough excess capacity to operate the switch day-to-day) and none to accommodate the new lines that an efficient carrier would need to meet the inevitable growth in demand. Similarly, the CLECs have routinely proposed fill factors of 85% or higher for all high-capacity loops and transport facilities.[231/] No matter what the facility, these aggressive fill factor assumptions are flawed for the same basic reason: contrary to the CLECs' unstated assumption, it is often quite *inefficient* for a carrier to maintain such small levels of spare capacity.

229/ *See, e.g.*, Surrebuttal Testimony of Brian F. Pitkin On Behalf of AT&T Communications of Virginia, Inc. and WorldCom, Inc., *Petition of WorldCom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Expedited Preemption of the Jurisdiction of the Va. State Corp. Comm'n Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration*, CC Docket No. 00-218 et al., at 84 (filed Sept. 21, 2001) (citing the *Inputs Order* in defense of proposed fill factors that are even higher than the SM's fill factors).

230/ HAI Consulting, Inc., *HAI Model Release 5.0 Inputs Portfolio* 75 (Jan. 27, 1998) <http://www.hainc.com/hminputs.pdf>. This exceeds even the SM's very high 94% fill factor for switching. *Inputs Order*, 14 FCC Rcd at 20296 ¶ 330; *see also* Tenth Supplemental Order, *In re Determining Costs for Universal Service*, Docket No. UT-980311(a) (Wash. Utils. & Transp. Comm'n Nov. 20, 1998) (rejecting AT&T's proposal to use HAI default fill factor of 98%).

231/ *See generally* HAI Consulting, Inc., *supra* note 230, at 89 (default transport terminal fill factor of 90%).

Fill factors can be conceptualized as a product of the total demand for an element divided by the total physical capacity of the facilities providing the element. One key reason why fill factors cannot realistically approach 100% is that capacity is "lumpy": the equipment available on the market increases in capacity only in large increments. Ground transportation provides a simple illustration of this point. Suppose that a trucking company must choose between vans and trucks as the vehicles for carrying cargo across the country. One truck has ten times the cargo capacity of a van, but the truck costs almost three times as much to operate. An economically efficient firm would substitute a truck for vans once the total cargo meets or exceeds the capacity of three vans, because the truck is less costly to send across the country than three vans. Note, however, that the total "fill" or utilization of the truck at that point is 33%. If the operator's primary objective were simply to achieve a utilization level of 85%, he would continue to use vans until he had enough cargo (*i.e.*, 9 vans). But that would be economically irrational. At a capacity of 8 vans, the operator would be spending nearly three times the amount it would cost if he had simply used the truck and "wasted" some capacity.

The telecommunications world is no different. High capacity loops, for example, typically come in one of two sizes: DS1s or DS3s. A DS1 circuit is the equivalent of 24 DS0s, and a DS3 is the equivalent of 28 DS1s or 672 DS0s. Because of the efficiencies associated with manufacturing and deploying equipment in standardized capacity increments, no one manufactures, for this market, the electronics needed for individual circuits with capacities falling *between* a DS1 and a DS3. An end user (or CLEC) that requires a high capacity loop therefore cannot typically purchase a single circuit with a capacity that exactly matches his particular needs, especially if the end user requires more capacity than a DS1 but less than a DS3. Instead, if an end user has a need for five DS1s, he purchases five DS1s. But because a

DS3 is less than 28 times as expensive as a DS1 (even though it has 28 times the capacity), it becomes more cost effective to purchase one DS3 loop with capacity needs equivalent only to 10 DS1s, even though the resulting fill factor for that element would be low: roughly 40%. A similar conclusion applies to interoffice dedicated transport circuits, as well: a single OC48 is less expensive than seven OC3s, even though the OC48 has 16 times the capacity of an OC3.

Likewise, efficient network engineering and design practices produce significant amounts of spare capacity in the facilities used to provide narrowband (*i.e.*, POTS) service. For example, spare copper cables allow a carrier to restore service much more quickly and inexpensively in the event of outages, and reduce maintenance costs by avoiding the need constantly to repair cables as they become defective. Sufficient spare capacity also permits carriers to meet the constantly shifting demand for additional lines and incremental demand growth without having to install new cables for every order. This is particularly true in Qwest's in-region service area, because the overwhelming majority of loop plant (between 70% and 80%) is buried and requires Qwest to dig new trenches whenever it must install additional cable. Thus, Qwest's practice is to deploy sufficient distribution capacity at the time of initial installation so that it can fill orders for additional lines without having to dig new trenches each time. Even after engineers have taken these and other factors into account to determine the desired levels of spare capacity to deploy on each route, they typically must select a larger copper cable size that is readily available and cost-effective to deploy.[232/]

[232/] Efficient engineering practices also include significant levels of spare capacity in DLC equipment. DLC equipment is designed so that some of the necessary electronics can be deployed cost-effectively in units with small capacity increments (typically called "plug-ins" or "channel units"). However, the shelf units into which plug-ins are installed and the RTs themselves (collectively referred to as "common electronics") are manufactured in much larger, "lumpier" capacity increments. Thus, DLC common electronics often must be deployed in

The upshot is that, with any given level of demand, the facilities arrangement that *minimizes costs* often bears no resemblance to the facilities arrangement that *produces the highest fill factor*. Indeed, maximizing fill factors would often produce profoundly inefficient results, such as sending eight vans across the country instead of one truck, or deploying 20 DS1s to an end user rather than one DS3. There are many circumstances in which a lower fill on a larger facility will result in lower costs, per unit and in total, and a higher fill on smaller facilities. The Commission appears to have recognized this point in certain limited settings, emphasizing that "Synthesis Model fill factors . . . *should not be used* for setting rates."[233/] The Commission should be even more explicit than this, however, and explain why high fill factors, whether or not reflected in the SM, would often represent grossly *inefficient* business practices.

4. Non-Recurring Charges.

In states throughout the country, AT&T has advocated a supposedly "forward looking" non-recurring cost model that imposes a nominal charge (less than $5.00) for loop provisioning activities, such as "coordinated loop cutovers" ("hot cuts"), that require the extensive use of

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capacity increments that are significantly higher than the capacity strictly needed to serve current demand.

233/ Memorandum Opinion and Order, *Application by Verizon New England Inc., Bell Atlantic Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions), Verizon Global Networks Inc., and Verizon Select Services, Inc., for Authorization To Provide In-Region, InterLATA Services in Vermont*, CC Docket No. 02-7, FCC 02-118, ¶ 36 (rel. Apr. 17, 2002) ("*Vermont 271 Order*") (emphasis added).

skilled labor at union wages.[234/] AT&T's advocacy on this point has met with surprising success in several forums, and it warrants special attention here.[235/]

An ordinary "hot cut" (even without the field testing discussed below) requires flesh-and-blood ILEC personnel to perform various tasks, including processing the order, going to the central office distribution frame, identifying the relevant facilities, disconnecting the appropriate line from the distribution frame leading to the ILEC switch, and running jumper cables to the CLEC's collocation space, where the line is ultimately connected to the CLEC's switch. Hot cuts further require ILEC and CLEC technicians to closely coordinate their efforts — *i.e.*, to synchronize an efficient loop cutover for a line already in use to ensure that the customer experiences only a momentary interruption in service. At least in Qwest's territory, AT&T would impose the same trivial charge not just for all of those activities, but also for all of those activities plus a specified battery of extra field tests ("hot cuts with testing") that CLECs may also order from Qwest's SGAT above and beyond the tests ordinarily used to ensure the successful performance of a hot cut. To conduct those extra tests, the ILEC would have to perform activities in addition to all of the above, often including dispatching technicians to visit the feeder-distribution interface and/or the customer premises to locate the proper connection points for the loop, verifying that the loop is attached to the correct number in the central office,

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234/ For example, AT&T argued in New Hampshire that 98.5% of Bell Atlantic's non-recurring costs were avoidable based on the assumption that GR-303 technology could support 100% automated loop provisioning. *See* Order, *In re Bell Atlantic*, DE 97-171, 210 P.U.R.4th 363 (N.H. Pub. Utils. Comm'n July 6, 2001).

235/ *See, e.g.*, Slip Opinion, *In re US West Communications, Inc.*, Docket No. P-442, 5321, 3167, 466, 421/CI-96-1540 (Minn. Pub. Utils. Comm'n Mar. 15, 2000) (adopting non-recurring charges of $2.38 for installation and $1.95 for disconnect for all loops, even if hot cut required); Verizon Pennsylvania Inc., PA PUC No. 216 (Verizon tariff) § 3, 5th rev. sheet 6 (May 11, 2001) (non-recurring charges of $7.42 for installation and $1.34 for disconnect, even if hot cut required).

placing a device on the line to check for shorts, verifying dB losses, and then waiting for confirmation from CLEC personnel that the loop actually works for its intended use.

With or without field testing, hot cuts are time-consuming, expensive activities for ILECs to undertake, and that is why the New York commission recently set the forward-looking cost of a hot cut at $185.[236/] Charging less than $5.00 for these activities could begin to make sense (if at all) only if these various services required no human labor: *i.e.*, only if it is inherently inefficient, given "currently available technology,"[237/] for central offices to be configured in a way that requires the use of skilled labor to disconnect lines from one carrier's switching facilities and reconnect them to another carrier's facilities. It is not.

In discounting the need for human involvement, AT&T appears to be positing a futuristic world in which (1) each ILEC has deployed massive amounts of GR-303 fiber throughout the network (because it is the only technology even theoretically capable of this automated function), and (2) each CLEC purchases dedicated DS1 links between each feeder-distribution interface serving any of its customers and the ILEC's central office (because otherwise there would be no way to flip a switch and connect any one of those customers to the CLEC collocation space without manual intervention).[238/] AT&T's approach violates TELRIC on two levels. First, there

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[236/] Verizon New York, Inc., PSC NY No. 10 Communications (Verizon Tariff) (hot cut charge consisting of the Service Order Charge, Provisioning Charge, and the Service Connection Central Office Wiring Charge). Verizon has nonetheless agreed to offer CLECs in New York a $150 "promotional" discount off that $185 hot cut rate for a limited time, apparently as part of a global understanding with the New York commission about a variety of retail and wholesale issues. *Id.*

[237/] 47 C.F.R. § 51.505(b)(1).

[238/] *See* Verizon Non-Recurring Cost Panel Surrebuttal Testimony, *Petition of WorldCom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration*, CC Docket No. 00-218, at 17-21 (filed Sept. 21, 2001).